Claims:

1. A method of expanding tubing, the method comprising applying a varying fluid pressure to the tubing.

2. The method of claim 1, wherein the tubing is expanded downhole.

3. The method of claim 1, wherein the varying fluid pressure acts across a wall of the tubing.

4. The method of claim 1, wherein the pressure within the tubing is varied.

5. The method of claim 1, wherein the pressure externally of the tubing is varied.

6. The method of claim 1, comprising pumping fluid into a volume of fluid operatively associated with the tubing.

7. The method of claim 1, comprising locating a body of varying volume in a volume of fluid operatively associated with the tubing.

8. The method of claim 1, comprising moving a wall portion defining a boundary of a volume of fluid operatively associated with the tubing.

9. The method of claim 1, comprising providing a pressurised fluid source.

10. The method of claim 9, wherein fluid is supplied at varying pressure from the source.

11. The method of claim 10, wherein fluid is delivered to the tubing from the source in a manner so as to vary the fluid pressure.

12. The method of claim 1, wherein an increase in pressure within the tubing is accompanied by a reduction in pressure externally of the tubing.

13. The method of claim 1, wherein fluid pressure externally of the tubing is maintained at a relatively low level by providing a relatively low density fluid externally of the tubing.

14. The method of claim 13, comprising by injecting a low density fluid into fluid surrounding the tubing.

15. The method of claim 1, wherein a volume of fluid externally of the tubing is at least partially isolated from a head of fluid above the tubing.

16. The method of claim 1, wherein fluid pressure internally of the tubing is maintained at a relatively high level by providing a relatively high density fluid internally of the tubing.

17. The method of claim 1, wherein a cycling fluid pressure is applied to the tubing.

18. The method of claim 1, wherein a portion of tubing to be expanded is at least partially isolated from ambient fluid by at least one seal, and a varying pressure differential is maintained across the at least one seal.

19. The method of claim 18, wherein a degree of leakage occurs across the at least one seal.

20. The method of claim 19, wherein leaking fluid lubricates the seal.

21. The method of claim 20, comprising producing a pressure pulse, and an associated elevated fluid pressure, which then decays as leakage occurs across the seal.

22. The method of claim 18, wherein the seal is moved relative to the tubing as the tubing is expanded.

23. The method of claim 1, wherein tubing expansion takes place substantially as a result of differential fluid pressure applied across the tubing wall.

24. The method of claim 23, wherein tubing expansion takes place solely as a result of differential fluid pressure applied across the tubing wall.

25. The method of claim 1, wherein the tubing is constrained such that only a limited degree of expansion is achievable.

26. The method of claim 25, wherein the tubing is located within a slightly larger bore.

27. The method of claim 1, wherein the tubing is mechanically formed during expansion.

28. The method of claim 1, wherein fluid pressure within the tubing is maintained at a base pressure, upon which base pressure a pressure increase is superimposed.

29. The method of claim 28, wherein pressure pulses are superimposed on the base pressure.

30. The method of claim 29, wherein the pressure increase takes the pressure acting on the tubing wall to within 10% of the yield pressure of the tubing wall.

31. The method of claim 29, wherein the pressure increase takes the pressure acting on the tubing wall to within 5% of the yield pressure of the tubing wall.

32. The method of claim 28, wherein the pressure increase takes the pressure acting on the tubing wall to at least the yield pressure of the tubing wall.

33. The method of claim 1, wherein a mechanical device is advanced through the tubing to occupy an increased volume within the tubing created at least in part by the varying fluid pressure.

34. The method of claim 33, wherein the device is advanced in stepwise fashion in concert with a series of variations in fluid pressure.

35. The method of claim 1, wherein a mechanical expansion force is applied to the tubing wall.

36. The method of claim 1, wherein a mechanical device retains expansion induced at least in part by fluid pressure.

37. The method of claim 36, wherein during periods of lower pressure the mechanical expansion device retains expansion produced during periods of elevated fluid pressure.

38. The method of claim 36, wherein a shallow angle cone is advanced through the tubing to retain expansion.

39. The method of claim 1, wherein a mechanical expansion device is translated relative to the tubing by fluid pressure.

40. The method of claim 1, wherein a mechanical expansion device is located between a pair of seals.

41. The method of claim 1, wherein a leading seal is provided on a mechanical device and the device is translated relative to the tubing by a pressure differential across the seal.

42. The method of claim 1, wherein the varying pressure is applied to a substantially isolated volume of fluid located between a pair of seals.

43. The method of claim 1, wherein a mechanical expansion supporting device is provided within a substantially isolated volume located between a pair of seals.

44. The method of claim 42, wherein the varying pressure is created by at least one of: a pulse generator operatively associated with the isolated volume; and by supplying at least one of elevated pressure fluid and pressure pulses from a source externally of the isolated volume.

45. The method of claim 1, wherein fluid operatively associated with the tubing is selected for its lubricating properties.

46. The method of claim 1, wherein fluid operatively associated with the tubing is selected for its flow characteristics.

47. The method of claim 1, wherein a multitude of bearing particles are provided in fluid operatively associated within the tubing.

48. The method of claim 1, further comprising providing a mechanical device for engaging the tubing and supplying fluid to contacting surfaces of the device and the tubing.

49. The method of claim 1, further comprising providing an expansion device and vibrating at least one of the tubing and the device.

50. The method of claim 1, further comprising providing expansion apparatus and applying a motive force to the apparatus to translate the apparatus relative to the tubing.

51. The method of claim 50, wherein the apparatus is translated by being pulled through the tubing.

52. The method of claim 50, wherein the apparatus is translated by being pushed through the tubing.

53. The method of claim 50, wherein the motive force comprises a fluid pressure force.

54. The method of claim 50, wherein the motive force comprises a mechanical force.

55. The method of claim 54, wherein the motive force is provided by a downhole tractor.

56. Apparatus for expanding tubing downhole, the apparatus comprising pressurising means for applying a varying fluid pressure to the tubing.

57. The apparatus of claim 56, wherein the pressurising means is adapted to create a fluid pressure differential across a wall of the tubing.

58. The apparatus of claim 56, wherein the pressurising means is adapted to vary the pressure within the tubing.

59. The apparatus of claim 56, wherein the pressurising means is adapted to vary the pressure externally of the tubing.

60. The apparatus of claim 56, wherein the pressurising means comprises a body of varying volume for location in a volume of fluid operatively associated with the tubing.

61. The apparatus of claim 56, wherein the pressurising means includes a movable wall forming a boundary of a volume of fluid operatively associated with the tubing.

62. The apparatus of claim 61, wherein the movable wall is operatively associated with an oscillating device.

63. The apparatus of claim 56, wherein the pressurising means comprises a pressurised fluid source.

64. The apparatus of claim 63, wherein the pressurised fluid source is adapted to supply fluid at varying pressure.

65. The apparatus of claim 64, comprising a fluid delivery conduit adapted to deliver fluid to the tubing from said source, and further adapted to vary the pressure of fluid delivered from said source.

66. The apparatus of claim 56, wherein the pressurising means comprises means for increasing the pressure within the tubing while reducing the pressure externally of the tubing.

67. The apparatus of claim 56, comprising means for reducing the fluid pressure externally of the tubing.

68. The apparatus of claim 67, wherein said means for reducing the fluid pressure externally of the tubing comprises means for injecting gas into the fluid surrounding the tubing.

69. The apparatus of claim 56, comprising a reciprocating pump operatively associated with at least one one-way valve.

70. The apparatus of claim 56, further comprising means for isolating a portion of tubing to be expanded from ambient fluid.

71. The apparatus of claim 70, wherein said isolating means comprises at least one seal.

72. The apparatus of claim 71, wherein said isolating means comprises at least two spaced seals for containing a volume of fluid therebetween.

73. The apparatus of claim 71, wherein said seal is adapted to permit a degree of leakage thereacross.

74. The apparatus of claim 71, wherein the seal comprises a plurality of seal members, each seal member adapted to maintain a fluid pressure differential thereacross.

75. The apparatus of claim 74, wherein the seal comprises at least five seal members.

76. The apparatus of claim 74, wherein the number of seal members is selected to provide for redundancy.

77. The apparatus of claim 74, wherein the seal comprises a labyrinth seal.

78. The apparatus of claim 56, wherein said pressurising means comprises means creating a cycling fluid pressure.

79. The apparatus of claim 56, wherein the pressurising means is adapted to produce at least one pressure pulse.

80. The apparatus of claim 56, further comprising a mechanical expansion device.

81. The apparatus of claim 56, wherein the pressurising means is adapted to maintain fluid pressure within the tubing at a base pressure below the yield pressure of the wall of the tubing and superimpose pressure pulses thereupon, taking the fluid pressure to at least the yield pressure of the wall of the tubing, to induce plastic deformation of the tubing.

82. The apparatus of claim 56, wherein the pressurising means is adapted to maintain fluid pressure within the tubing at a base pressure below the yield pressure of the wall of the tubing and superimpose pressure pulses thereupon, such that the

fluid pressure is then in excess of the yield pressure of the wall of the tubing, to induce plastic deformation of the tubing.

83. The apparatus of claim 56, further comprising a mechanical expansion device.

84. The apparatus of claim 83, wherein the mechanical expansion device comprises an expansion cone.

85. The apparatus of claim 83, wherein the mechanical expansion device comprises a rotary expansion device.

86. The apparatus of claim 83, wherein the expansion device is adapted to stabilise a tubing expansion process.

87. The apparatus of claim 83, wherein the expansion device is adapted to assist in achieving a desired expanded tubing form.

88. The apparatus of claim 83, wherein the mechanical expansion device is adapted to retain expansion induced by elevated fluid pressure.

89. The apparatus of claim 83, wherein the expansion device comprises a shallow angle cone.

90. The apparatus of claim 89, wherein the cone angle no more than 11 degrees.

91. The apparatus of claim 83, wherein the expansion device is adapted to be advanced through expanding tubing in concert with periods of elevated pressure.

92. The apparatus of claim 83, further comprising drive means for translating the expansion device through the tubing.

93. The apparatus of claim 83, further comprising means for translating the expansion device relative to the tubing.

94. The apparatus of claim 93, wherein the translating means is a tractor.

95. The apparatus of claim 83, wherein the expansion device is provided in combination with at least one seal adapted to contain a pressure differential thereacross and induce a translating force.

96. The apparatus of claim 83, wherein the expansion device is located between a pair of seals.

97. The apparatus of claim 96, wherein the expansion device is located between a leading seal and a trailing seal, the leading seal being coupled to the expansion device such that a pressure differential across the seal tends to urge the expansion device forward.

98. The apparatus of claim 96, wherein the pressurising means is provided between the seals.

99. The apparatus of claim 98, wherein the pressurising means is in the form of a pulse generator.

100. The apparatus of claim 96, wherein the pressurising means is adapted to supply elevated pressure fluid from a source externally of a volume between the seals.

101. The apparatus of claim 56, further comprising means for supplying fluid.

102. The apparatus of claim 56, in combination with a fluid to be pressurised.

103. The apparatus of claim 102, wherein the fluid comprises a lubricant.

104. The apparatus of claim 102, wherein the fluid has a viscosity selected to minimise leakage past seals associated with the apparatus.

105. The apparatus of claim 56, comprising an expansion device and means for vibrating at least one of the expansion device and the tubing.

106. A method of expanding tubing by extending a wall of the tubing, the method comprising:

applying a base pressure to the tubing, the base pressure being below the yield pressure of the tubing wall; and

applying pressure pulses to the tubing in excess of said base pressure.

107. The method of claim 106 wherein the pressure pulses are such that the tubing wall experiences fluid pressure of at least 90% of the yield pressure of the tubing.

108. The method of claim 107 wherein the pressure pulses are such that the tubing wall experiences fluid pressure at least equal to the yield pressure of the tubing.

109. The method of claim 108, comprising applying pressure pulses to the tubing in excess of said base pressure such the tubing wall experiences fluid pressure in excess of the yield pressure of the tubing.

110. A method of expanding tubing by extending a wall of the tubing, the method comprising:

applying a base pressure to the tubing, the base pressure being below the yield pressure of the tubing wall; and

applying pressure pulses to the tubing in excess of said base pressure such that the tubing wall experiences an expansion force at least equal to the yield pressure of the tubing.

111. The method of claim 110, wherein said expansion force is provided by at least one of fluid pressure force and mechanical force.

112. A method of expanding tubing by extending a wall of the tubing, the method comprising:

isolating a portion of tubing;

applying a base pressure to the isolated portion of tubing, the base pressure creating a differential pressure across a wall of the tubing below the yield pressure of the tubing wall; and

applying pressure pulses to the isolated portion of tubing in excess of said base pressure.

113. The method of claim 112, comprising applying pressure pulses to the tubing in excess of said base pressure such that the tubing wall experiences fluid pressure of at least 90% of the yield pressure.

114. The method of claim 113, comprising applying pressure pulses to the tubing in excess of said base pressure such that the tubing wall experiences an expansion force at least equal to the yield pressure of the tubing.

115. A method of expanding tubing by extending a wall of the tubing, the method comprising:

isolating a portion of tubing containing an expansion device;

applying a base pressure to the isolated portion of tubing, the base pressure creating a differential pressure across a wall of the tubing below the yield pressure of the tubing wall;

applying pressure pulses to the isolated portion of tubing in excess of said base pressure such that the tubing is expanded; and

translating the expansion device to occupy the expanded tubing.

116. A method of expanding tubing downhole, the method comprising providing a column of relatively high density fluid to create a hydrostatic pressure and applying at least said hydrostatic pressure to bear on a selected portion of the tubing.

117. A method of creating a fluid pressure actuating force in a bore, the method comprising providing a column of relatively high density fluid to create hydrostatic pressure and utilising said hydrostatic pressure to create an actuating force.

118. A method of expanding tubing, the method comprising applying a varying fluid pressure to the tubing, wherein a portion of tubing to be expanded is at least partially isolated from ambient fluid by at least one seal, and a varying pressure differential is maintained across the at least one seal, and wherein the at least one seal is arranged to provide for a degree of leakage thereacross.

119. The method of claim 118, wherein leaking fluid lubricates the at least one seal.

120. The method of claim 119, comprising producing a pressure pulse, and an associated elevated fluid pressure, which then decays as leakage occurs across the seal.

121. A method of expanding tubing, the method comprising:

applying a varying fluid pressure to tubing having an internal volume, the varying fluid pressure serving at least in part to increase said volume; and

advancing a mechanical device is through the tubing to occupy said increased volume.

122. The method of claim 121, wherein the device is advanced in stepwise fashion in concert with a series of variations in fluid pressure.

123. The method of claim 122, wherein during periods of lower pressure the mechanical expansion device retains expansion produced during periods of elevated fluid pressure.

124. Apparatus for expanding tubing downhole, the apparatus comprising:

pressurising means for applying a varying fluid pressure to the tubing, and

at least one seal for isolating a portion of tubing to be expanded from ambient fluid, said at least one seal being adapted to permit a degree of leakage thereacross.

125. The apparatus of claim 124, a plurality of seal members are provided, each seal member adapted to maintain a fluid pressure differential thereacross.

126. The apparatus of claim 125, wherein at least five seal members are provided.

127. The apparatus of claim 124, wherein the at least one seal comprises a labyrinth seal.

128. Apparatus for expanding tubing downhole, the apparatus comprising:

pressurising means for applying a varying fluid pressure to the tubing; and

an expansion cone adapted to retain expansion induced by elevated fluid pressure.

129. The apparatus of claim 128, wherein the expansion device comprises a shallow angle cone.

130. The apparatus of claim 128, wherein the cone angle no more than 11 degrees.